# ACID DYES FOR WORSTED PIECE-GOODS

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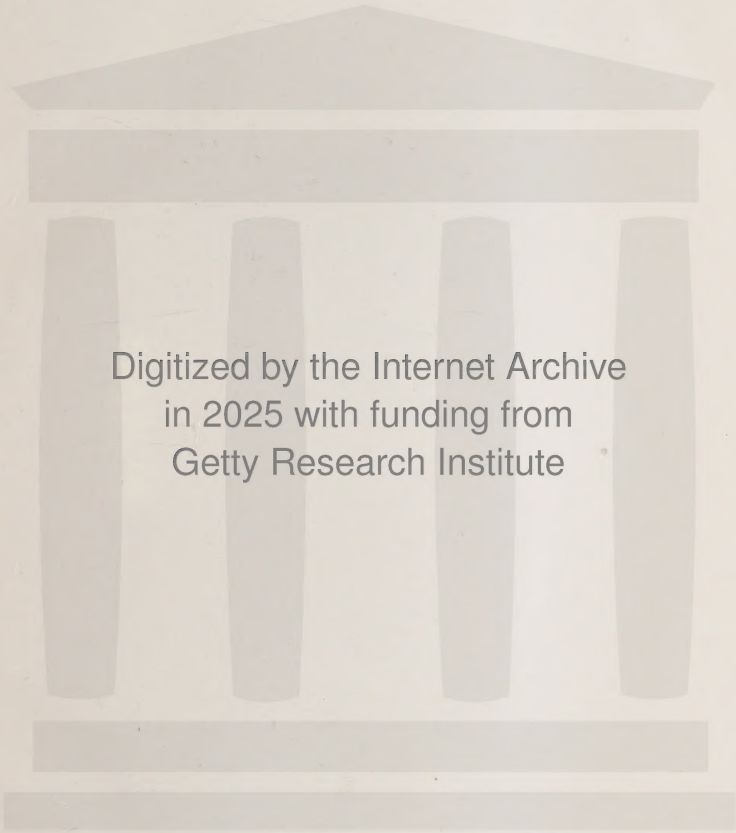
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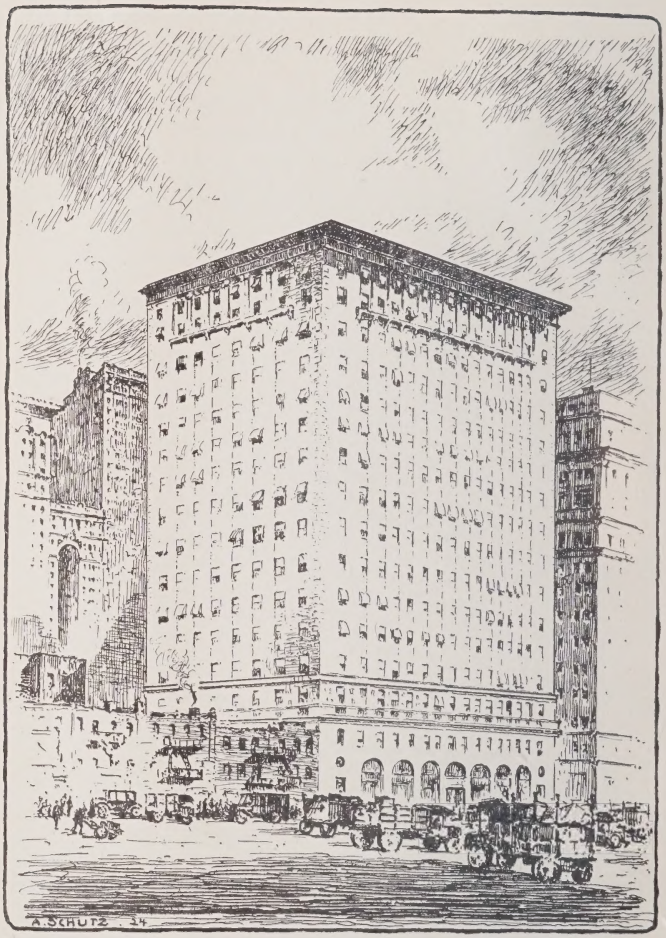


*Executive Offices of the*

NATIONAL ANILINE & CHEMICAL CO., INC.

*located at*

40 Rector Street, New York

# Acid Dyes for Worsted Piece-Goods

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NATIONAL ANILINE & CHEMICAL COMPANY INC.

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# PREFACE

*Since the publication of the previous edition of "Acid Colors," the line of National Acid Dyes has been augmented by a number of new and important members of this class. A revision of the work has consequently become necessary in order to present the subject completely.*

*In this third and revised edition, the National Aniline & Chemical Company, Inc., offers an extended range of Acid Dyes, with which practically any desired shades, with whatever degree of fastness necessary, may be obtained upon the fabrics to which this class of dyes may be suitably applied. The usefulness of this publication has also been increased by including, opposite the dyeings, our observations in regard to some of the more important properties of each dye.*

*The statements made herein, with respect to our several products, are expressions of our opinion based upon careful tests and investigation, and are not warranties.*

# GENERAL DIRECTIONS FOR THE APPLICATION OF ACID DYES TO WOOL

All percentages given in the following pages are based upon the weight of the material to be dyed, unless otherwise specified.

Two general methods are in use for the application of Acid Dyes, one which calls for the use of a strong acid, usually Sulfuric, and the other for a weak acid such as Acetic or Formic.

## Dyeing with a Strong Acid:

Prepare the dye-bath with the requisite amount of dye and

10 to 20% Glauber's Salt Crystals
2 to 4% Sulfuric Acid 66° Bé. or 168° Tw.

or with

10% Bisulfate of Soda.

Enter the material at 120° to 140° F. Bring to the boil in about ½ hour, and continue boiling for from 1 to 1¼ hours. Near the end of the operation, a further addition of acid may be made if necessary, in order to exhaust the bath more completely.

## Dyeing with a Weak Acid:

Prepare the dye-bath with the requisite amount of dye, and

10 to 20% Glauber's Salt Crystals
5 to 8% Acetic Acid (28%)

*or*

10 to 20% Glauber's Salt Crystals
2 to 3% Formic Acid

Enter the material at 110° to 120° F., bring to the boil in about ¾ hour, and continue boiling for from 1 to 1¼ hours. If necessary, in order to exhaust the bath, additional Acetic Acid, well diluted, may be fed on after ½ to ¾ hour boiling. In some instances the addition of ½ to 1% Sulfuric Acid is necessary to exhaust the bath.

## NOTES

### Dissolving the Dye:

National Acid Dyes are dissolved best by pouring boiling water over the dye and stirring, if necessary with boiling, until complete solution is obtained. Soft water should be used for this purpose and as a final precaution, to avoid the entrance of undissolved dye into the dye-bath, the solution should be strained through a cloth or a fine sieve.

### Glauber's Salt:

Glauber's Salt Crystals is used with Acid Dyes for the purpose of slowing up the dyeing process and so promoting even dyeing and penetration. Smaller amounts should be used with dyes that level easily and exhaust slowly or incompletely, than with those of opposite characteristics. Too much Glauber's Salt will cause the wool to become harsh and more than 20% cannot be recommended.

### Acids:

Acid is used to hasten the rate of dyeing, to increase the exhaustion of the dye-bath and to properly fix the dye. The degree of acidity necessary to accomplish this, varies greatly according to the nature of the dye used. While the majority of Acid Dyes will produce satisfactory results within the limits set by the dyeing methods given above, the initial acidity of the dye-bath must be still further reduced for some. In such cases, instead of starting with 5 to 8% Acetic Acid, 5 to 10% Acetate of Ammonia is used for some dyes and for others 10 to 15% of Ammonium Sulfate will be found advantageous.

DYES FOR WHICH SULFURIC ACID IS RECOMMENDED:

All acid dyes for which no special treatment is specified may be dyed with Sulfuric Acid. This applies particularly to their use in straight shades and in full combination shades. For pale shades, difficult combinations and in such instances where difficulty is encountered in obtaining level shades and desired penetration, dyeing should be commenced with 10 to 20% Glauber's Salt Crystals, and 5 to 8% Acetic Acid (28%). After boiling for one-half hour, 1 to 2% Sulfuric Acid is added to effect the proper exhausting of the dye-bath. It is well to add this acid gradually in diluted form. A further precaution is to shut off the steam while making this addition.

The following list comprises the best levelling colors which may be used for combination shades and dyed with Sulfuric Acid and Glauber's Salt Crystals:

National Quinoline Yellow
National Fast Wool Yellow 3GL
National Wool Orange 2G Crystals
National Fast Crimson GR
National Acid Fuchsine D
National Fast Crimson 6BL
National Acid Fast Violet BG
National Alkali Fast Green 2G
National Wool Green B
National Wool Green S

DYES FOR WHICH ACETIC ACID IS RECOMMENDED:

National Azo Yellow A5W
National Metanil Yellow 1955
National Wool Scarlet BR
National Fast Red S Conc.
National Cloth Red 2R
National Erie Scarlet B
National Cloth Red B
National Wool Violet 4BN
National Resorcine Brown R
National Resorcine Brown RN
National Buffalo Black AR
National Buffalo Black 2AB
National Buffalo Black AB
National Buffalo Black 4AB
National Cloth Red R

DYES FOR WHICH ACETATE OF AMMONIA IS RECOMMENDED:

National Fast Wool Cyanone R
National Fast Wool Cyanone 3R
National Durol Black B
National Durol Black 2B

With the above dyes the addition of

¼% Bichromate of Soda or Potash

and a dyeing temperature just below the boil will be found advantageous.

DYES FOR WHICH AMMONIUM SULFATE IS RECOMMENDED:

The following dyes require a very low initial acidity for level dyeing, but a rather high final acidity in order to exhaust the bath. This is best accomplished by starting with,

10 to 15% Ammonium Sulfate

with the gradual addition, near the end of the operation, of

1 to 2% Sulfuric Acid 66° Bé., or 168° Tw. well diluted.

National Fast Wool Blue B
National Fast Wool Blue R
National Fast Wool Violet B

## EFFECT OF METALS

The effects produced on National Acid Dyes by the metals commonly used for the construction of dyeing machines are listed in the table following.

| COLOR | EFFECT OF | | |
|---|---|---|---|
| | MONEL METAL | COPPER | IRON |
| National Quinoline Yellow | Practically unaffected. | Slightly redder and duller. | Appreciably redder and duller |
| National Fast Wool Yellow 3GL | Practically unaffected. | Considerably redder and duller. | Appreciably redder and duller |
| National Wool Yellow Extra Conc. | Practically unaffected. | Considerably redder and duller. | Slightly greener and duller. |
| National Azo Yellow A5W | Practically unaffected. | Slightly duller. | Appreciably duller. |
| National Metanil Yellow 1955 | Practically unaffected. | Slightly duller. | Appreciably duller. |
| National Wool Orange 2G Crystals | Practically unaffected. | Slightly redder and duller. | Slightly redder and duller. |
| National Croceine Orange Y Conc. | Practically unaffected. | Appreciably redder and duller. | Much duller. |
| National Wool Orange A Conc. | Slightly redder. | Appreciably redder and duller. | Much duller. |
| National Lake Scarlet R | Practically unaffected. | Slightly duller. | Slightly duller. |
| National Erie Scarlet B | Practically unaffected. | Slightly duller. | Considerably duller. |
| National Croceine Scarlet MOO | Practically unaffected. | Appreciably duller. | Slightly duller. |
| National Wool Scarlet BR | Practically unaffected. | Practically unaffected. | Slightly duller. |
| National Fast Red S Conc. | Practically unaffected. | Practically unaffected. | Slightly duller. |
| National Brilliant Scarlet 3R | Practically unaffected. | Appreciably duller. | Slightly duller. |

| COLOR | EFFECT OF | | |
|---|---|---|---|
| | MONEL METAL | COPPER | IRON |
| National Fast Crimson GR | Practically unaffected. | Appreciably bluer and duller. | Considerably bluer and duller. |
| National Azo Rubine Extra | Practically unaffected. | Slightly bluer and duller. | Slightly bluer and duller. |
| National Fast Crimson R | Practically unaffected. | Slightly bluer and duller. | Slightly bluer and appreciably duller. |
| National Fast Fuchsine G | Slightly bluer and duller. | Considerably bluer and duller. | Much bluer and duller. |
| National Cloth Red 2R | Slightly bluer and duller. | Appreciably bluer and duller. | Slightly bluer and duller. |
| National Wool Red 40F | Practically unaffected. | Slightly duller. | Slightly bluer and duller. |
| National Cloth Red B | Slightly duller. | Appreciably duller. | Appreciably duller. |
| National Azo Bordeaux | Practically unaffected. | Very slightly bluer and duller. | Slightly bluer and duller. |
| National Acid Fuchsine D | Practically unaffected. | Appreciably bluer and duller. | Slightly bluer and appreciably duller. |
| National Fast Crimson 6BL | Practically unaffected. | Appreciably bluer and duller. | Considerably bluer and duller. |
| National Fast Fuchsine 6B | Slightly bluer and duller. | Appreciably bluer and slightly duller. | Appreciably bluer and duller. |
| National Fast Wool Violet B | Very slightly bluer. | Slightly bluer and duller. | Appreciably bluer and duller. |
| National Fast Wool Violet 2R | Slightly duller. | Appreciably duller. | Considerably duller. |
| National Azo Wool Violet 4B | Practically unaffected. | Slightly duller. | Appreciably duller. |

| COLOR | EFFECT OF | | |
|---|---|---|---|
| | MONEL METAL | COPPER | IRON |
| National Wool Violet 4BN | Slightly redder. | Slightly redder. | Very slightly redder. |
| National Fast Wool Blue R | Practically unaffected. | Appreciably bluer and duller. | Considerably bluer and duller. |
| National Wool Blue CG | Practically unaffected. | Slightly redder and duller. | Slightly greener, considerably duller. |
| National Fast Wool Blue B | Practically unaffected. | Very slightly redder and duller. | Slightly redder and duller. |
| National Alkali Fast Green 2G | Practically unaffected. | Very slightly duller. | Slightly duller. |
| National Acid Green L Extra | Practically unaffected. | Very slightly duller. | Slightly yellower and duller. |
| National Fast Acid Green B | Practically unaffected. | Practically unaffected. | Appreciably yellower and duller. |
| National Wool Green B | Slightly yellower and duller | Appreciably yellower and duller. | Considerably yellower and duller. |
| National Wool Green S | Practically unaffected. | Slightly yellower and duller. | Appreciably yellower and duller. |
| National Induline B Extra | Practically unaffected. | Very slightly duller. | Slightly duller. |
| National Resorcine Brown R | Practically unaffected. | Appreciably duller. | Slightly duller. |
| National Resorcine Brown RN | Practically unaffected. | Very slightly duller. | Slightly duller. |
| National Alphazurine 2G | Practically unaffected. | Appreciably greener and duller. | Considerably greener and duller. |

| COLOR | EFFECT OF | | |
|---|---|---|---|
| | MONEL METAL | COPPER | IRON |
| National Alphazurine FG | Practically unaffected. | Slightly greener and duller. | Appreciably greener and duller. |
| National Alphazurine A | Practically unaffected. | Slightly greener and duller. | Appreciably greener and duller. |
| National Indigotine | Practically unaffected. | Very slightly greener. | Slightly greener. |
| National Alizarine Sapphire FS | Practically unaffected. | Very slightly redder and duller. | Slightly redder and duller. |
| National Alizarine Sapphire | Practically unaffected. | Slightly redder. | Appreciably redder. |
| National Alizarine Sapphire SE | Practically unaffected. | Very slightly redder and duller. | Slightly redder and duller. |
| National Acid Fast Violet BG | Practically unaffected. | Very slightly bluer and duller. | Very slightly bluer. |
| National Brilliant Wool Blue B | Practically unaffected. | Appreciably redder and duller. | Slightly redder and duller. |
| National Brilliant Wool Blue N | Practically unaffected. | Very slightly duller. | Slightly duller. |
| National Wool Navy B | Practically unaffected. | Slightly duller. | Slightly duller. |
| National Azo Fast Blue G High Conc. | Practically unaffected. | Very slightly redder and duller. | Slightly redder and duller. |
| National Azo Fast Blue B High Conc. | Practically unaffected. | Very slightly redder and duller. | Slightly redder and duller. |
| National Azo Fast Blue 2R High Conc. | Practically unaffected. | Very slightly redder and duller. | Slightly redder and duller. |
| National Fast Wool Cyanone R | Practically unaffected. | Practically unaffected. | Slightly duller. |
| National Fast Wool Cyanone 3R | Practically unaffected. | Practically unaffected. | Slightly duller. |

| COLOR | EFFECT OF | | |
|---|---|---|---|
| | MONEL METAL | COPPER | IRON |
| National Buffalo Black RB | Practically unaffected. | Slightly duller. | Slightly redder and duller |
| National Buffalo Black AR | Practically unaffected. | Practically unaffected. | Practically unaffected. |
| National Buffalo Black 2AB | Practically unaffected. | Practically unaffected. (Very slightly duller.) | Slightly duller. |
| National Buffalo Black AB | Practically unaffected. | Practically unaffected. (Very slightly duller.) | Practically unaffected. (Very slightly duller.) |
| National Buffalo Black SB | Practically unaffected. | Practically unaffected. (Very slightly duller.) | Practically unaffected. (Very slightly duller.) |
| National Buffalo Black 4SB | Practically unaffected. | Slightly duller. | Practically unaffected. (Very slightly duller.) |
| National Buffalo Black 2SB | Practically unaffected. | Very slightly duller. | Practically unaffected. (Very slightly duller.) |
| National Buffalo Black 8B | Practically unaffected. (Very slightly greener.) | Practically unaffected. (Very slightly greener.) | Practically unaffected. (Very slightly greener.) |
| National Buffalo Black 3G | Practically unaffected. | Very slightly duller. | Very slightly duller. |
| National Buffalo Black 10B | Practically unaffected. | Slightly greener. | Appreciably greener. |
| National Buffalo Black NBR | Practically unaffected. | Very slightly duller. | Very slightly duller. |
| National Buffalo Black 4AB | Practically unaffected. | Very slightly duller. | Very slightly duller. |
| National Durol Black B | Practically unaffected. | Practically unaffected. (Very slightly duller.) | Practically unaffected. (Very slightly duller.) |
| National Durol Black 2B | Practically unaffected. | Very slightly duller. | Very slightly duller. |

## EFFECT THREADS

### Cotton

All but a few National Acid Dyes leave cotton effect threads clear or but very slightly stained.

The following stain cotton appreciably, but an additional treatment in a fresh acid bath will satisfactorily clear the cotton of these colors.

National Azo Yellow A5W
National Erie Scarlet B
National Croceine Scarlet MOO
National Wool Scarlet BR
National Cloth Red 2R
National Cloth Red B
National Cloth Red R
National Fast Red S Conc.
National Fast Wool Cyanone R
National Fast Wool Cyanone 3R
National Durol Black B
National Durol Black 2B

### Artificial Silk or Rayon (Viscose, Chardonnet and Cupro-Ammonium):

The same general effects are obtained with Rayon as with cotton, the tendency being to leave the former fibre even clearer than cotton. Any slight staining which may occur is readily cleared by the method above mentioned.

### Silk

The following Acid Dyes, when dyed on wool by the usual methods, will leave silk threads clear or but very slightly stained:

National Wool Yellow Ex. Conc.
National Wool Orange 2G Crys.
National Brilliant Scarlet 3R
National Fast Crimson GR
National Wool Red 40F
National Fast Crimson 6BL
National Acid Fuchsine D
National Fast Wool Violet B
National Fast Wool Violet 2R
National Azo Wool Violet 4B
National Indigotine
National Alizarine Sapphire
National Alizarine Sapphire SE
National Alizarine Sapphire BN
National Wool Blue CG
National Buffalo Black 8B

The following dye silk to practically the same depth as wool and are suitable for solid shade effects on Glorias (Wool and Silk Unions):

National Quinoline Yellow
National Fast Wool Yellow 3GL
National Azo Yellow A5W
National Wool Orange A Conc.
National Croceine Orange Y Conc.
National Croceine Scarlet MOO
National Erie Scarlet B
National Fast Red S Conc.
National Resorcine Brown R
National Resorcine Brown RN
National Wool Violet 4BN
National Acid Fast Violet BG
National Brilliant Wool Blue B
National Brilliant Wool Blue N
National Fast Wool Cyanone R
National Fast Wool Cyanone 3R
National Induline B Extra
National Alphazurine A
National Alphazurine 2G
National Alphazurine FG
National Acid Green L Extra
National Fast Acid Green B
National Alkali Fast Green 2 G
National Durol Black B
National Durol Black 2B

CELLULOSE ACETATE (LUSTRON AND CELANESE):

The following Acid Dyes, even when applied in full shade, leave Cellulose Acetate effect threads clear or passably so:

National Fast Wool Yellow 3GL
National Wool Yellow Extra Conc.
National Metanil Yellow 1955
National Wool Orange 2G Crystals
National Wool Orange A Conc.
National Lake Scarlet R
National Brilliant Scarlet 3R
National Fast Crimson GR
National Fast Fuchsine G
National Fast Red S Conc.
National Azo Rubine Extra
National Azo Bordeaux
National Wool Red 40F
National Fast Crimson R
National Fast Crimson 6BL
National Acid Fuchsine D
National Fast Fuchsine 6B
National Resorcine Brown RN
National Fast Wool Violet B
National Acid Fast Violet BG
National Fast Wool Violet 2R
National Azo Wool Violet 4B
National Wool Blue CG
National Azo Fast Blue B High Conc.
National Azo Fast Blue G High Conc.
National Azo Fast Blue 2R High Conc.

National Fast Wool Blue B
National Fast Wool Blue R
National Fast Wool Cyanone R
National Fast Wool Cyanone 3R
National Indigotine
National Alphazurine A
National Alphazurine FG
National Alphazurine 2G
National Alizarine Sapphire
National Alizarine Sapphire SE
National Alizarine Saphire BN
National Alizarine Sapphire FS
National Wool Navy B
National Acid Green L Extra
National Fast Acid Green B
National Alkali Fast Green 2G
National Wool Green S
National Wool Green B
National Buffalo Black 8B
National Buffalo Black 10B

Certain of our Acid Dyes, namely,

National Quinoline Yellow
National Azo Yellow A5W
National Wool Violet 4BN
National Induline B Extra

will dye this class of fibre, although not as full a shade as they do on the wool.

## FASTNESS TESTS

In this edition of "Acid Dyes for Worsted Piece-Goods," the fastness of the dyes to the more important agencies is recorded in tabular form. Great care has been exercised to make this record accurate. The difficulty of expressing degrees of fastness, however, is so great, that the dyer is advised to use this record as a guide only, and to confirm the observations recorded, before applying them to his own special conditions.

### LIGHT:

Dyes are graded in regard to fastness to light as follows:

(1) Excellent
(2) Good
(3) Fair
(4) Moderate
(5) Slight

Such dyes as National Fast Wool Yellow 3GL and National Alizarine Sapphire SE are graded as "excellent." National Wool Red 40F and National Wool Violet 4BN may be taken as typical examples of those possessing "moderate" fastness.

WASHING:

The washing test upon which observations have been recorded corresponds to the ordinary household washing usually applied to Woolen and Worsted Fabrics.

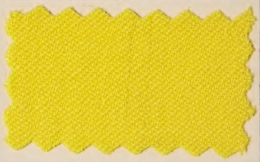
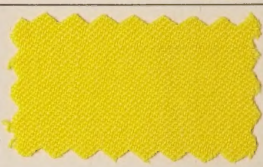
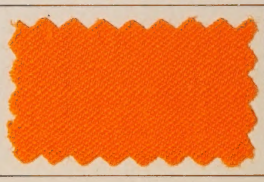
FULLING:

To test fastness to this agent, the material is fulled 20 minutes at 30° C. (85° F.) in a volume of 2% neutral soap solution equivalent to 40 times the weight of material.

DECATIZING:

Fastness to decatizing is determined by subjecting the material to a steam pressure of 25 lb. for 15 minutes.

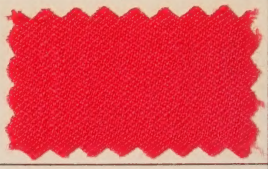
# DYEINGS AND TABULATION
## OF
# PROPERTIES

| | | |
|---|---|---|
| 1.<br>National<br>Quinoline Yellow<br>1% 3% | | |
| 2<br>National<br>Fast Wool Yellow 3GL<br>1% 3% |  | |
| 3.<br>National<br>Wool Yellow Extra Conc.<br>½% 2% |  | |
| 4.<br>National<br>Azo Yellow A5W<br>½% 1½% | | |
| 5.<br>National<br>Metanil Yellow 1955<br>½% 1% | | |
| 6.<br>National<br>Wool Orange 2G Crystals<br>¾% 2% | | |
| 7.<br>National<br>Croceine Orange Y Conc.<br>¾% 2% | | |
| 8.<br>National<br>Wool Orange A Conc.<br>¾% 2% |  | |

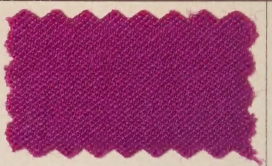
| FASTNESS TO | | | | | | |
|---|---|---|---|---|---|---|
| *Light* | *Washing* | *Fulling* | *Decatizing* | *Alkali: Street mud and dust* | *Level Dyeing* | *Dischargeability with Hydrosulfite* |
| Fair | Moderate. Turns redder | Moderate | Excellent | Good | Excellent. Can be fed on at the boil | Not affected. Suitable for color discharge |
| Excellent | Fair. Turns slightly redder | Moderate | Fair | Good | Excellent. Can be fed on at the boil | Good |
| Good | Fair. Turns slightly redder | Moderate | Good | Good | Good | Fair. Whites slightly tinted |
| Fair | Fair | Moderate | Moderate. Turns redder and duller | Fair | Fair | Excellent |
| Good | Fair | Fair | Fair. Slightly duller | Excellent | Fair | Excellent |
| Excellent | Fair | Moderate | Good | Good | Excellent. Can be fed on at the boil | Excellent |
| Good | Fair | Moderate | Good | Good | Fair | Excellent |
| Good | Fair | Moderate | Good | Good | Good | Good. Whites slightly tinted |

| | | |
|---|---|---|
| 9. *National Lake Scarlet R* 1% | 3% | |
| 10. *National Erie Scarlet B* ¾% | 2½% | |
| 11. *National Croceine Scarlet MOO* ¾% | 2% | |
| 12. *National Wool Scarlet BR* ¾% | 2% | |
| 13. *National Brilliant Scarlet 3R* ¾% | 2½% | |
| 14. *National Fast Fuchsine G* ½% | 2% | |
| 15. *National Fast Crimson GR* ¾% | 2½% | |
| 16. *National Fast Red S Conc.* ½% | 1½% | |

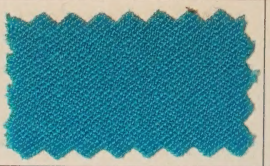
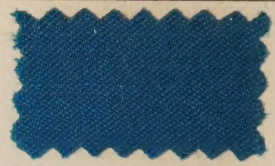
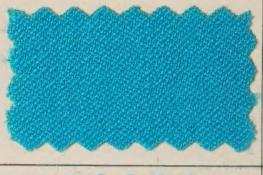
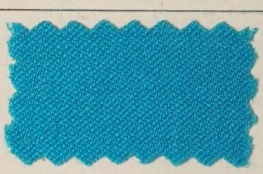
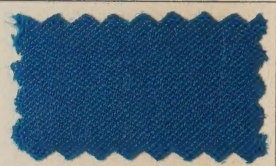
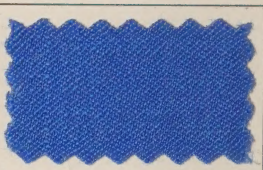
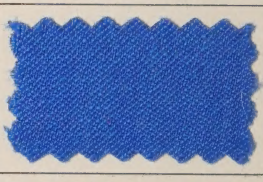
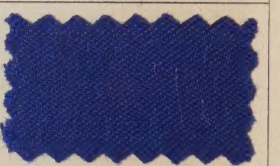
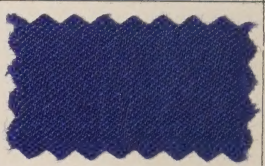
| FASTNESS TO | | | | | | |
|---|---|---|---|---|---|---|
| *Light* | *Washing* | *Fulling* | *Decatizing* | *Alkali: Street mud and dust* | *Level Dyeing* | *Discharge-ability with Hydrosulfite* |
| Good | Fair | Moderate | Fair. Turns slightly bluer | Good | Fair | Excellent |
| Good | Fair | Good | Excellent | Good | Moderate; see text | Good. Whites. slightly tinted |
| Good | Fair. Stains Cotton | Moderate. Stains Cotton | Good | Good | Fair | Good. Whites slightly tinted |
| Fair | Fair | Fair | Fair. Slightly yellower and duller | Fair | Moderate; see text | Good. Whites slightly tinted |
| Good | Fair | Moderate | Fair. Turns slightly bluer | Fair | Good in heavy shades | Excellent |
| Good | Fair | Slight | Good | Moderate | Excellent | Not dischargeable |
| Good | Good | Moderate | Good | Fair | Excellent. Can be fed on at the boil | Good. Whites slightly tinted |
| Good | Good | Fair | Excellent | Good | Moderate | Fair. Whites appreciably tinted |

| | | |
|---|---|---|
| 17. National Cloth Red R ½% 1½% |  | |
| 18. National Cloth Red 2R ½% 1½% | | |
| 19. National Azo Rubine Extra ½% 1½% | | |
| 20. National Fast Crimson R ¾% 2½% | | |
| 21. National Wool Red 40F ¾% 2% | | |
| 22. National Cloth Red B ½% 1½% | | |
| 23. National Azo Bordeaux ¾% 2% | | |
| 24. National Acid Fuchsine D ¾% 2% | | |

| FASTNESS TO | | | | | | |
|---|---|---|---|---|---|---|
| *Light* | *Washing* | *Fulling* | *Decatizing* | *Alkali: Street mud and dust* | *Level Dyeing* | *Dischargeability with Hydrosulfite* |
| Good | Good. Severe washing weakens shade | Good. White cotton and silk slightly stained | Good | Moderate | Moderate; see text | Excellent |
| Good | Good. Severe washing weakens shade | Good. White cotton and silk slightly stained | Good | Moderate | Moderate; see text | Excellent |
| Fair | Fair | Moderate | Good | Fair | Good in heavy shades | Excellent |
| Good | Good | Moderate | Fair. Turns slightly bluer | Moderate | Good | Excellent |
| Moderate | Good | Fair | Good | Moderate | Good in heavy shades | Excellent |
| Good | Good | Good. White cotton and silk slightly stained | Good | Fair | Moderate; see text | Moderate. Whites appreciably tinted |
| Fair | Fair | Moderate | Fair | Moderate | Moderate | Good |
| Moderate | Good | Fair | Good | Excellent | Excellent. Can be fed on at the boil | Not dischargeable |

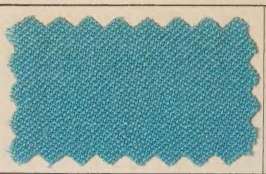
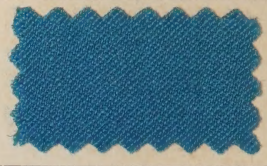
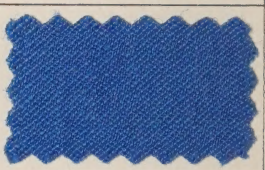
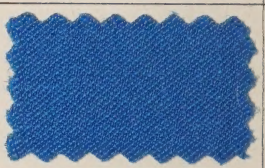
| | | |
|---|---|---|
| 25. *National Fast Crimson 6BL* ¾% 2% | | |
| 26. *National Fast Fuchsine 6B* ¾% 2% |  | |
| 27. *National Fast Wool Violet B* 1% 3% | | |
| 28. *National Fast Wool Violet 2R* 1% 3% | | |
| 29. *National Azo Wool Violet 4B* 1% 3% | | |
| 30. *National Wool Violet 4BN* ½% 2% | | |
| 31. *National Acid Fast Violet BG* ¾% 2% | | |
| 32. *National Wool Blue CG* ¾% 2% | | |

| FASTNESS TO | | | | | | |
|---|---|---|---|---|---|---|
| *Light* | *Washing* | *Fulling* | *Decatizing* | *Alkali: Street mud and dust* | *Level Dyeing* | *Discharge-ability with Hydrosulfite* |
| Good | Good | Moderate | Fair. Slightly duller | Fair | Excellent. Can be fed on at the boil | Good. Whites slightly tinted |
| Fair | Fair | Slight | Fair. Slightly bluer | Moderate | Excellent | Not dischargeable |
| Good | Moderate | Moderate | Slight. Turns redder | Fair | Good in heavy shades | Not dischargeable |
| Good | Fair | Fair | Fair | Excellent | Excellent in heavy shades | Good |
| Fair | Fair | Moderate | Fair | Good | Excellent in heavy shades | Good |
| Slight to Moderate | Good | Good | Good | Good | Moderate | Moderate. Whites appreciably tinted |
| Fair | Good | Fair | Good | Good | Excellent. Can be fed on at the boil | Moderate. Whites appreciably tinted |
| Fair | Fair | Moderate | Fair | Fair | Excellent in heavy shades | Good |

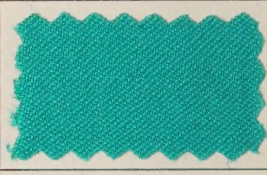
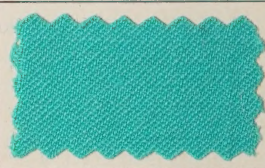
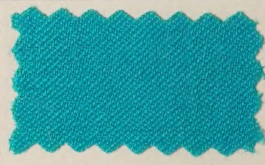
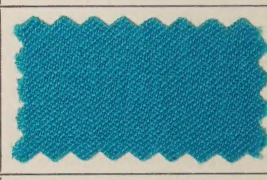
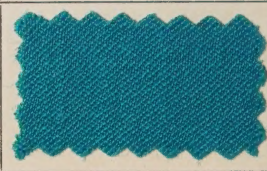
| | | |
|---|---|---|
| 33. *National Alphazurine 2G* ½% 2% |  |  |
| 34. *National Alphazurine FG* ½% 2% |  | |
| 35. *National Alphazurine A* ½% 2% |  |  |
| 36. *National Brilliant Wool Blue N* ½% 2% |  | |
| 37. *National Brilliant Wool Blue B* ½% 2% |  |  |
| 38. *National Fast Wool Blue B* 1% 2½% |  | |
| 39. *National Fast Wool Blue R* 1% 2½% | | |
| 40. *National Wool Navy B* 2½% 5% | | |

FASTNESS TO

| *Light* | *Washing* | *Fulling* | *Decatizing* | *Alkali: Street mud and dust* | *Level Dyeing* | *Discharge-ability with Hydrosulfite* |
|---|---|---|---|---|---|---|
| Moderate to Fair | Fair | Fair | Satisfac-tory for mode shades in dress goods | Good | Excellent. Can be fed on at the boil | Whites appreciably tinted |
| Moderate to Fair | Fair | Good | Good | Good | Excellent | Whites appreciably tinted |
| Fair | Good | Good | Good | Good | Good | Whites appreciably tinted |
| Moderate | Good | Good | Fair | Fair | Fair | Moderate. Whites appreciably tinted |
| Moderate | Good | Good | Good | Fair | Fair | Moderate. Whites appreciably tinted |
| Excellent in full shades | Fair | Fair | Fair. Slightly greener | Good | Fair; see text | Moderate. Whites tinted yellow |
| Excellent in full shades | Fair | Fair | Fair. Slightly greener | Good | Fair; see text | Moderate. Whites tinted yellow |
| Fair | Moderate | Moderate | Fair | Good | Excellent in heavy shades | Moderate. Whites appreciably tinted |

| | | |
|---|---|---|
| 41. National Indigotine ¾% 2% |  |  |
| 42. National Alizarine Sapphire FS ¾% 2% | | |
| 43. National Alizarine Sapphire ¾% 2% | | |
| 44. National Alizarine Sapphire SE ¾% 2% |  | |
| 45. National Alizarine Sapphire BN ¾% 2% |  | |
| 46. National Azo Fast Blue G High Conc. 2% 4% | | |
| 47. National Azo Fast Blue B High Conc. 2% 4% | | |
| 48. National Azo Fast Blue 2R High Conc. 2% 4% | | |

| FASTNESS TO | | | | | | |
|---|---|---|---|---|---|---|
| *Light* | *Washing* | *Fulling* | *Decatizing* | *Alkali: Street mud and dust* | *Level Dyeing* | *Dischargeability with Hydrosulfite* |
| Moderate | Moderate | Slight | Good | Moderate | Good | Not dischargeable |
| Good | Moderate | Moderate | Good | Good | Good | Not dischargeable |
| Excellent | Moderate | Moderate | Good | Good | Good | Not dischargeable |
| Excellent | Moderate | Moderate | Good | Good | Good | Not dischargeable |
| Excellent | Moderate | Moderate | Good | Good | Good | Not dischargeable |
| Good | Fair | Moderate | Good | Excellent | Excellent in heavy shades | Moderate. Whites appreciably tinted |
| Good | Fair | Moderate | Good | Excellent | Excellent in heavy shades | Moderate. Whites appreciably tinted |
| Good | Fair | Moderate | Good | Excellent | Excellent in heavy shades | Moderate. Whites appreciably tinted |

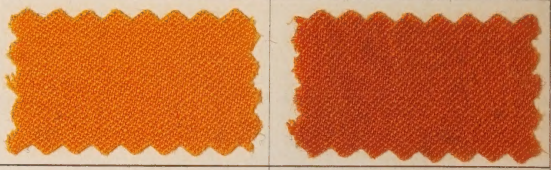
| | | |
|---|---|---|
| 49. National Fast Wool Cyanone R 1½% | 3% | |
| 50. National Fast Wool Cyanone 3R 1½% | 3% | |
| 51. National Induline B Extra 1½% | 3% | |
| 52. National Alkali Fast Green 2G ¾% | 2½% |  |
| 53. National Acid Green L Extra ¾% | 2½% |  |
| 54. National Fast Acid Green B ¾% | 2½% |  |
| 55. National Wool Green B 1% | 3% |  |
| 56. National Wool Green S 1% | 3% |  |

| FASTNESS TO | | | | | | |
|---|---|---|---|---|---|---|
| *Light* | *Washing* | *Fulling* | *Decatizing* | *Alkali: Street mud and dust* | *Level Dyeing* | *Dischargeability with Hydrosulfite* |
| Excellent in full shades | Good | Good | Slight. Turns brown | Good | Moderate; see text | Not dischargeable |
| Excellent in full shades | Good | Good | Slight. Turns brown | Good | Moderate; see text | Not dischargeable |
| Slight on wool; good on silk | Good | Good | Good | Fair | Moderate | Not dischargeable |
| Fair | Good | Fair | Fair | Fair | Excellent. Can be fed on at the boil | Fair. Whites slightly tinted |
| Moderate | Fair | Moderate | Good | Slight | Excellent | Fair. Whites slightly tinted |
| Moderate | Good | Good | Good | Moderate | Good | Fair. Whites slightly tinted |
| Fair | Good | Good | Fair | Fair | Excellent. Can be fed on at the boil | Not dischargeable |
| Fair | Good | Good | Fair | Fair | Excellent. Can be fed on at the boil | Not dischargeable |

57.

*National*
*Resorcine Brown R*

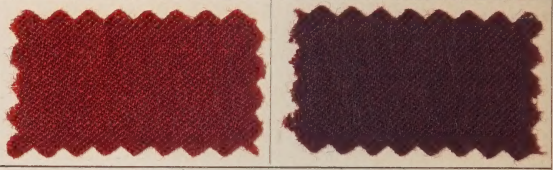
¾% 2%



58.

*National*
*Resorcine Brown RN*

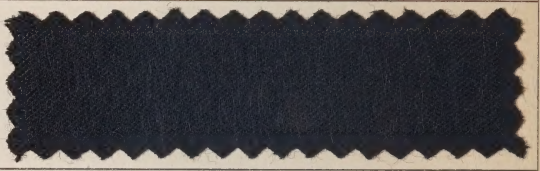
1% 2½%



59.

*National*
*Buffalo Black AB*

7%



60.

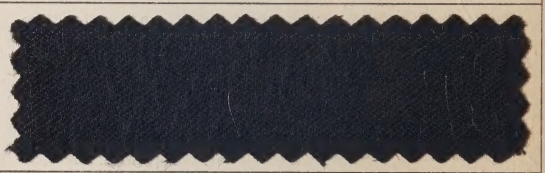
*National*
*Buffalo Black 2AB*

7%

61.

*National*
*Buffalo Black 4AB*

7%



62.

*National*
*Buffalo Black SB*

7%

63.

*National*
*Buffalo Black 2SB*

7%

64.

*National*
*Buffalo Black 4SB*

7%

| FASTNESS TO | | | | | | |
|---|---|---|---|---|---|---|
| *Light* | *Washing* | *Fulling* | *Decatizing* | *Alkali: Street mud and dust* | *Level Dyeing* | *Dischargeability with Hydrosulfite* |
| Fair | Fair | Fair | Fair | Fair | Moderate | Whites appreciably tinted |
| Good | Moderate | Fair | Fair | Good | Moderate | Whites appreciably tinted |
| Fair to Good | Fair | Fair | Moderate. Turns redder and duller | Good | Fair | Not dischargeable |
| Fair to Good | Fair | Fair | Moderate. Turns redder and duller | Good | Fair | Not dischargeable |
| Fair to Good | Fair | Fair | Moderate. Turns redder and duller | Good | Fair | Not dischargeable |
| Fair to Good | Fair | Fair | Fair | Good | Good | Not dischargeable |
| Fair to Good | Fair | Fair | Fair | Good | Good | Not dischargeable |
| Fair to Good | Fair | Fair | Fair | Good | Good | Not dischargeable |

| | |
|---|---|
| 65.<br>*National*<br>*Buffalo Black 3G*<br>5% | |
| 66.<br>*National*<br>*Buffalo Black NBR*<br>5% C.I. 246 | |
| 67.<br>*National*<br>*Buffalo Black 8B*<br>5% Pr. 141 | |
| 68.<br>*National*<br>*Buffalo Black 10B*<br>5% C.I. 294 | |
| 69.<br>*National*<br>*Buffalo Black AR*<br>7% | |
| 70.<br>*National*<br>*Buffalo Black RB*<br>5% | |
| 71.<br>*National*<br>*Durol Black 2B*<br>7% C.I. 307 | |
| 72.<br>*National*<br>*Durol Black B*<br>7% C.I. 307 | |

FASTNESS TO

| *Light* | *Washing* | *Fulling* | *Decatizing* | *Alkali: Street mud and dust* | *Level Dyeing* | *Dischargeability with Hydrosulfite* |
|---|---|---|---|---|---|---|
| Good | Fair | Fair | Fair. Turns slightly greener | Good | Good | Not dischargeable |
| Good | Fair | Fair | Fair | Good | Good | Moderate. Whites considerably tinted |
| Good | Fair | Fair | Fair | Good | Good. Slightly better than National Buffalo Black 3G and NBR | Not dischargeable |
| Good | Fair | Fair | Fair | Excellent | Good. Slightly better than National Buffalo Black 3G and NBR | Not dischargeable |
| Fair | Fair | Good | Slight Turns brown | Good | Fair | Not dischargeable |
| Fair | Fair | Fair | Moderate. Turns redder and duller | Good | Good | Not dischargeable |
| Good | [redacted] Good | Fair | Moderate. Turns bluer | Good | Moderate; see text | Not dischargeable |
| Good | [redacted] Good | Fair | Moderate. Turns bluer | Good | Moderate; see text | Not dischargeable |

# "National" Service

THE National Aniline & Chemical Company, Inc., is convinced that the essence of all good-will is intelligent service.

In accordance with this conviction, the National Aniline & Chemical Company, Inc., maintains a fully equipped laboratory, a trained technical staff, and an experienced sales organization at each branch office. This practical dyeing service is freely placed at the disposal of its customers for the matching of shades and for assistance in the solution of dyeing problems.

Shade cards, illustrating the application of National Dyes on all classes of materials are prepared and distributed to those interested in dyeing.

The improvement of dyeing technique is the key-note of "National" Service.

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